

C. T. CHESTER.  
DIAL TELEGRAPH.

No. 40,324.

Patented Oct. 20, 1863.

Fig. 1.

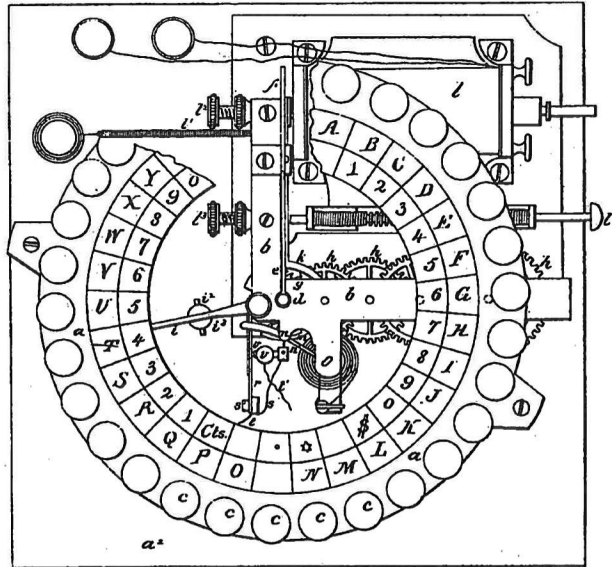
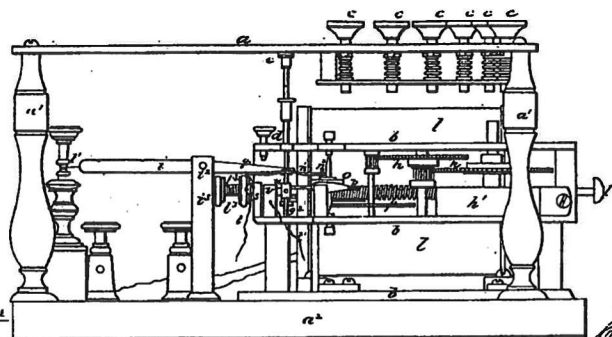


Fig. 2.



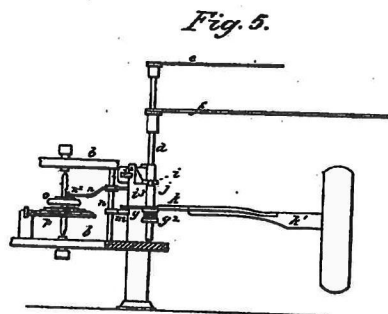
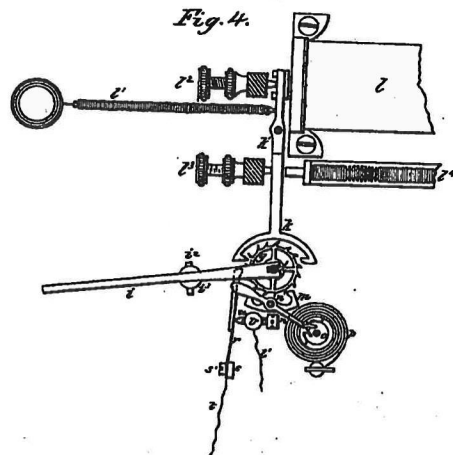
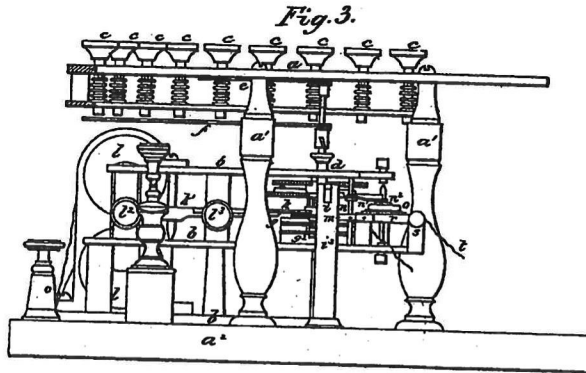
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Inventor:  
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# UNITED STATES PATENT OFFICE.

CHARLES T. CHESTER, OF NEW YORK, N. Y.

## IMPROVEMENT IN DIAL-TELEGRAPHS.

Specification forming part of Letters Patent No. 40,324, dated October 20, 1863.

*To all whom it may concern:*

Be it known that I, CHARLES T. CHESTER, of the city and county of New York, and State of New York, have invented certain new and useful Improvements in Electro-Magnetic Dial-Telegraphs; and I do hereby declare that the following is a full and correct description thereof, reference being had to the annexed drawings, making a part of this specification, of which—

Figure 1 is a plan view of my improved instrument; Fig. 2, a front elevation; Fig. 3, a side elevation; Fig. 4, detached plan view of shifting needle-shaft with escapement-wheel and receiving and transmitting pallets, &c; Fig. 5, elevation of the same.

My present improved instrument differs from the dial-telegraph patented by me February 25, 1862, in several important features, although, when arranged to receive messages, its operation as a receiving-instrument is substantially the same—*i. e.*, the needle or pointing-hand is driven by a train of clock-work and controlled by a pallet attached to the armature-lever of the receiving-magnet; but in my present machine I also use the train of clock-work to actuate a circuit-breaker under the control and regulation of a balance-wheel or pendulum, the circuit-breaker being arrested to identify the letter by keys on the dial, (corresponding to the lettered or numbered spaces,) which, when depressed, come in contact with an arm on the needle-shaft and stop the motion of the clock-work until released to proceed to another letter, and this constitutes one of the leading features of my present invention.

Another part of my invention consists in making the vertical needle-shaft movable in its bearings a short distance, sufficient to transfer the escape-wheel, which I use as a circuit-breaker, from engagement with the pallet of the balance-wheel and the spring-connection, against which the teeth of the escape-wheel act to open the circuit, into engagement with the armature-lever pallet of the receiving-magnet.

As the instrument is now arranged the balance-wheel pallet and spring-connection lie in a horizontal plane just below the plane of the armature-pallet; therefore the change of position necessary to transfer the escape-wheel and

needle-shaft from the control of the balance wheel pallet to the armature-pallet is slight and easily effected by a shifting-lever, and does not interfere with the constant connection of the needle-shaft carrying the escape-wheel by its pinion with the train of clock-work.

In the use of the instruments the circuit is through the spring-connection in the sending-instrument and the magnet of the receiving-instrument at the distant station; but the circuit-breaker being on the needle-shaft, the sending-instrument has the message indicated on the dial exactly the same as on the receiving-instrument.

By the use of a balance-wheel or pendulum in connection with the escape-wheel when acting as a circuit-breaker, a regular and uniform action of the circuit-breaker is obtained at any desired rate of speed within the capacity of the receiving-magnets used. My improved instruments, thus convertible at pleasure by merely moving the shifting-lever from a receiving to a transmitting instrument, or vice versa, enables persons without exercise of skill to receive and transmit messages as rapidly as the magnets have capacity to operate with certainty.

More particularly to describe my invention, I will refer to the drawings by letters of reference.

The dial *a*, divided into any desired number of equal-sized lettered or numbered spaces, as shown, is supported by column *a'* fixed in a wooden base, *a''*, which also supports the frame *b* of the main parts of the instrument.

Upon the dial are mounted stops or keys *c* corresponding with the lettered or numbered divisions of the dial. They are made in the usual manner of dial-keys, the stems projecting down through the dial, and are provided with springs to lift them when the operator removes his hand.

A vertical shaft, *d*, in the axis of the dial, carries the dial-needle or pointing-hand *e*, a longer hand or arm, *f*, just below the dial reaching out to the key-stems, an escapement-wheel, *g*, and a pinion, *g'*, by which said shaft is connected to a train of clock-work, *h*, propelled by a spring, *h'*.

A shifting-lever, *i*, having its fulcrum-pin *i'* at the top of the standard *i''* engages with its forked end in a groove, *j*, around the vertical

needle-shaft *d* in the manner of a clutch-shifter for the purpose of raising the needle-shaft in its bearings whenever it is necessary to transfer the escape-wheel to the armature-pallet *h* of the receiving-magnet *l*. When the shaft is thus raised it is supported by the shifting-lever, the forked part and groove forming a bearing.

I would here remark that the escapement-wheel might be confined to the shaft by a spline, so as to admit of being shifted by the shifting-lever instead of shifting the shaft itself, and would answer the same purpose mechanically; but I prefer the escape-wheel to be fixed and to shift the shaft, as described.

A spring, *U*, and adjusting-screws *P* *P'*, the latter encircled by a spiral spring, regulate the action of the armature-lever *k'*. When the escape-wheel is in its normal position it lies just below the plane of the armature-pallet and in the embrace of a pallet, *m*, which is supported by and vibrates with the vertical lever-shaft *n*, through which it connects by the lever *n'* and pin *n''* with the balance-wheel *o*, which is provided with a suitable hair-spring, *p*.

A stop, *q*, on the shifting-lever prevents the pallet-lever from throwing back too far.

Now, any of the devices used for adjusting, increasing, and diminishing the rate of motion of the balance-wheel may be used, if deemed necessary, in connection with the balance; but in practice great nicety is not required, and it will be sufficient to make the balance-wheel small enough to admit of as great speed as will come surely within the capacity of the magnets, leaving a margin for varying condition of the line.

In the same horizontal plane as the balance-wheel pallet is a metallic spring, *r*, secured to a stud, *s*, projecting upward from the frame, by an insulated pin, *s'*, and connected with a conducting-wire, *t*.

The spring *r* presses against the point of a horizontal adjusting-screw, *u*, which works in a screw-hole through a stud, *v*, also attached to the frame, and which is connected with a conducting-wire, *t'*. The circuit being through the wire *t*, spring *r*, screw *u*, stud *v*, and conducting-wire *t'*, is broken when the spring is pressed back from the point of the screw, which is done by the points of the teeth of the escapement-wheel as they rotate pressing tooth by tooth upon the projecting end of the spring,

which, at the place of contact with the tooth, is insulated therefrom by attaching to the end of the spring a piece of hard rubber, *w*, or other suitable insulating material, in manner and shape as shown in the drawings, being a strip of hard rubber with a wedge-shape projection toward the escape-wheel teeth, the shape allowing it to fall between the teeth as they pass.

By setting the screw which bears against the spring (the circuit) in or out, the length of time the circuit will remain open while the tooth of the escape-wheel is passing will be lengthened or shortened.

Now, it will be evident that the action of the wheel may close the circuit if the same be placed on the other side of the spring; but I prefer to use the wheel to open the circuit.

The points of contact of the screw and spring should be armed with platina.

This instrument is designed to be used in connection with a bell or other signal-magnet, and also with the switches commonly used to transfer the main circuit from the receiving-magnet of sounders or recording-instruments to the transmitting-key; but such devices are so well known that a particular description is unnecessary.

I claim—

1. The circuit-breaker, in combination with a train of clock-work whereby it is actuated, and a balance-wheel whereby its uniform action is secured, substantially as described.

2. The combination of the needle of a dial-telegraph with a circuit-breaker actuated by clock-work and regulated by a balance-wheel, substantially as described.

3. The combination of dial-keys with a circuit-breaker driven by clock-work and regulated by a balance-wheel, substantially as described.

4. In combination with the needle of a dial-telegraph the shifting escapement-wheel constantly connected with, and actuated by, a train of clock-work when arranged to shift from the armature-lever pallet of the receiving-magnet to the pallet of a balance-wheel controlling and regulating the action of the mechanism for opening and closing the circuit, substantially as and for the purposes described.

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Witnesses:

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